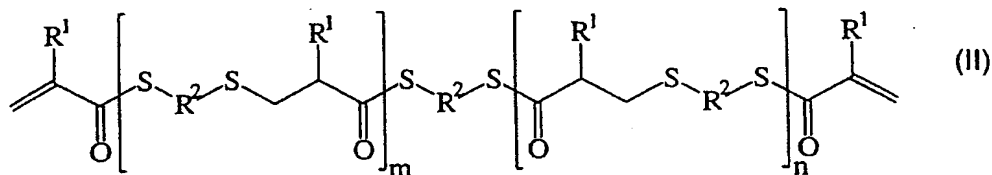


Claims

1. Mixture containing
A) compounds of the formula (I) and (II)



where R^1 is independently at each instance hydrogen or a methyl radical,
 R^2 is independently at each instance a linear or branched, aliphatic or cycloaliphatic radical or a substituted or unsubstituted aromatic or heteroaromatic radical and
 m and n are each independently an integer of not less than 0 subject to the proviso that $m + n > 0$,

and

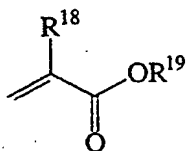
B) at least one ethylenically unsaturated monomer (A) which is different from the compounds of the formula (I) and (II).

2. Mixture according to Claim 1, characterized in that it contains more than 10 mol%, based on the total amount of compounds of the formula (I) and (II), of compounds of the formula (II) where $m+n=2$.
3. Mixture according to Claim 1 or 2, characterized in that the radical R^2 is an aliphatic radical having 1 to 10 carbon atoms.
4. Mixture according to at least one of the preceding claims, characterized in that it contains more than 5.8 mol%, based on the total amount of the compounds of the formula (I) and (II), of compounds of the formula (II) where $m+n=3$.
5. Mixture according to at least one of the preceding claims, characterized in that it contains 0.1 to 50.0 mol%, based on the total amount of the compounds of the formula (I) and (II), of compounds of the formula (I).

- 5 6. Mixture according to at least one of the preceding claims, characterized in that it contains more than 30 mol%, based on the total amount of the compounds of the formula (I) and (II), of compounds of the formula (II) where $m+n=1$.
- 10 7. Mixture according to at least one of the preceding claims, characterized in that it contains compounds of the formula (II) where $m+n>3$.
- 15 8. Mixture according to one or more of the preceding claims, characterized in that it [sic] the total fraction of compounds of the formula (I) and (II) is at least 5.0% by weight, based on the total weight of the mixture.
- 20 9. Mixture according to at least one of the preceding claims, characterized in that it contains at least one thiourethane compound (T) as monomer (A), said compound (T) being in turn obtainable by
 - a) reaction of one equivalent of at least one diisocyanate of the formula (X)
OCN-R⁹-NCO (X)
where
R⁹ is a linear or branched aliphatic or cycloaliphatic radical or a substituted or unsubstituted aromatic or heteroaromatic radical,
30 with
v_D equivalents of a dithiol of the general formula (XI)
HS-R¹⁰-SH (XI)
where
35 v_D is from 0.1 to 0.9,
R¹⁰ is a linear or branched, aliphatic or cycloaliphatic radical or a substituted or unsubstituted aromatic or heteroaromatic radical,
40 or
v_D equivalents of a mixture comprising at least one dithiol of the general formula (II) and at least one compound of the general formula (V)
HO-R¹¹-ZH (XII)
45 where
R¹¹ is a linear or branched, aliphatic or cycloaliphatic radical or a substituted or unsubstituted aromatic or heteroaromatic radical,
50 Z is oxygen or sulphur,
in the presence of a catalytically effective amount of a known urethane chemistry catalyst,

especially pyridine, diazobicyclo(2.2.2)octane, collidine and/or picoline

- 5 b) reaction - in the presence of customary reaction-catalyzing and -stabilizing compounds - of at least one α,ω -difunctional thiourethane compound of step a) with
- 10 v_H equivalents of at least one hydroalkyl (meth)acrylate of the general formula (XIII)
 $CH_2=C(R^{12})-COO[CH(R^{13})]_q-CH_2-OH$ (XIII)
 where
 $v_H = 2 - 2 * v_D$,
 R^{12} is hydrogen or a methyl radical,
 15 R^{13} is hydrogen or a linear or branched alkyl radical having 1 to 4 carbon atoms, and
 q is a positive integer from 1 to 3.
- 20 10. Mixture according to Claim 9, characterized in that the radical R^{13} is hydrogen.
- 25 11. Mixture according to Claim 9 or 10, characterized in that the hydroxyalkyl (meth)acrylate(s) of the formula (XIII) are 2-hydroxyethyl methacrylate, 2-hydroxyethyl acrylate, 4-hydroxybutyl methacrylate and 4-hydroxybutyl acrylate.
- 30 12. Mixture according to one or more of Claims 9 to 11, characterized in that the radical R^9 is an aliphatic radical having 2 to 9 carbon atoms.
- 35 13. Mixture according to one or more of Claims 9 to 12, characterized in that the radical R^{10} is an aliphatic radical having 1 to 10 carbon atoms, preferably a linear aliphatic radical having 2 to 8 carbon atoms.
- 40 14. Mixture according to one or more of Claims 9 to 13, characterized in that it contains at least one ethylenically unsaturated monomer (B) which is different from the thiourethane compound (T), as a monomer (A).
- 45 15. Mixture according to Claim 14, characterized in that at least one ethylenically unsaturated monomer (B) is a (meth)acrylate of the formula (XIV)

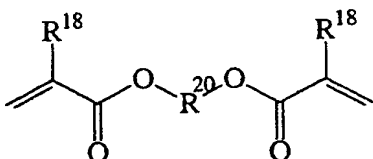


(XIV),

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where R^{18} is hydrogen or methyl and R^{19} is a linear or branched alkyl or cycloalkyl radical or an aromatic radical having 1 to 40 carbon atoms,

a di(meth)acrylate of the formula (XV)



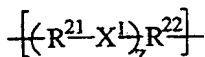
(XV),

10

where R^{18} is independently at each instance hydrogen or methyl and R^{20} is a linear or branched, aliphatic or cycloaliphatic radical or a radical of the general formula (XVa)

15

(XVa)



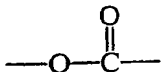
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where R^{22} is a linear or branched, aliphatic or cycloaliphatic radical, z is an integer between 1 and 1 000.

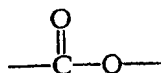
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R^{21} is independently at each instance a linear or branched, aliphatic or cycloaliphatic radical and X^1 is independently at each instance hydrogen or sulphur, an ester group of the general formula (XVb), (XVc)

(XVb)

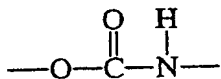


(XVc)

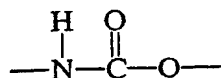


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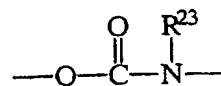
a urethane group of the general formula (XVd), (XVe), (XVf) or (XVg)



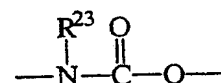
(XVd)



(XVe)



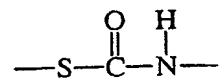
(XVf)



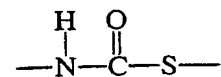
(XVg)

a thiourethane group of the general formula
(XVh), (XVi), (XVj) or (XVk)

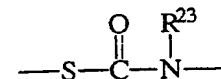
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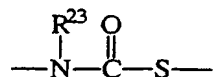
(XVh)



(XVi)



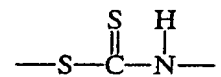
(XVj)



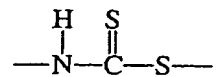
(XVk)

10

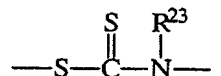
a dithiourethane group of the general formula
(XVl), (XVm), (XVn) or (XVo)



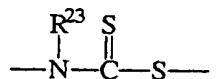
(XVl)



(XVm)

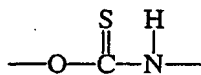


(XVn)

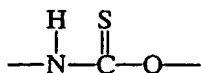


(XVo)

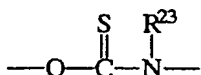
or a thiocarbamate group of the general formula (XVp), (XVq), (XVr) or (XVs)



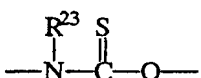
(XVp)



(XVq)



(XVr)



(XVs)

5

where R^{23} is a linear or branched, aliphatic or cycloaliphatic radical, and/or styrene.

- 10 16. Mixture according to Claim 15, characterized in that the monomer (B) is a di(meth)acrylate of the formula (XV).
- 15 17. Process for producing a highly transparent plastic, characterized in that a mixture according to at least one of the preceding claims is polymerized.
- 20 18. Highly transparent plastic obtainable by a process according to Claim 17.
- 25 19. Highly transparent plastic according to Claim 16, characterized in that its DIN 53491 refractive index is greater than 1.6.
- 30 20. Highly transparent plastic according to Claim 17 or 18, characterized in that its DIN 53491 Abbe number is greater than 36.
- 35 21. Highly transparent plastic according to at least one of Claims 17 to 19, characterized in that its ISO 179/1fU Charpy impact toughness is greater than 3.0 kJ/m².
22. Highly transparent plastic according to at least one of Claims 17 to 20, characterized in that its DIN 5036 transmission is greater than 88.5%.

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- 23. Highly transparent plastic according to at least one of Claims 17 to 21, characterized in that its ISO 306 Vicat temperature is greater than 50.0°C.
- 5 24. Use of the highly transparent plastic according to at least one of Claims 17 to 22 as an optical lens, preferably as an ophthalmic lens.
- 10 25. Optical and especially ophthalmic lens comprising a highly transparent plastic according to at least one of Claims 17 to 22.